

## CLAIMS

What is claimed is:

- 5           1. An apparatus for horizontally actuating  
hemming and stamping die sets, said apparatus  
comprising:
- a horizontal base support;
  - a roller device horizontally mounted on top  
10 of said horizontal base support;
  - a linear guidance system set in said  
horizontal base support;
  - a drive support vertically attached to said  
horizontal base support;
  - 15 a drive mechanism supported by said drive  
support;
  - an anvil die set held by said drive  
support;
  - a vertically extending platen, said  
20 vertically extending platen resting on top of the  
horizontal base support and loosely guided by said  
linear guidance system;
  - a punch die set held by said vertical  
platen;
  - 25 a plurality of bushings set in the punch  
die set;
  - at least three guide shafts, each secured  
to said anvil die set on one end and each engaged to  
one of said bushings of said punch die set on the  
30 other end; and
  - a plurality of link bars attached on one  
end to said vertical platen via link bar attachments  
and coupled on the other end to said drive mechanism,

wherein the actuation of the drive mechanism moves the vertical platen in a horizontal direction along the linear guidance system.

5                   2. The apparatus of claim 1 wherein the anvil die set is held on the drive support by a drive support connection feature located in the center of the inside face of the drive support.

10                   3. The apparatus of claim 1 wherein the punch die set is held on the vertical platen by a platen connection feature located in the center of the inside face of the vertical platen.

15                   4. The apparatus of claim 1 further comprising at least one compliance device.

                  5. The apparatus of claim 4 wherein the compliance device is located on the platen connection  
20 feature.

                  6. The apparatus of claim 4 wherein the compliance device is located on the drive support connection feature.

25                   7. The apparatus of claim 4 wherein the compliance device is located on the link bar attachments.

30                   8. The apparatus of claim 1 wherein the roller device uses ball type rollers.

9. The apparatus of claim 1 wherein the drive mechanism includes a plurality of crank arms, a plurality of bearing blocks, a plurality of tube-type misalignment couplings, a drive motor, a gearbox and  
5 at least one drive shaft, said drive motor being connected to said gearbox, said gearbox being connected to said drive shaft, said drive shaft being connected to said tube-type misalignment couplings, said tube-type misalignment couplings being connected  
10 to said bearing blocks and said bearing blocks being connected to said crank arms.

10. The apparatus of claim 9 wherein the crank arms are designed to allow for 180° rotation  
15 and oscillation.

11. The apparatus of claim 9 wherein the crank arms are designed to allow for a continuous 360° motion.  
20

12. The apparatus of claim 10 wherein the drive shaft is a single inline shaft arrangement.

13. The apparatus of claim 10 wherein the  
25 drive shaft is a dual drive shaft arrangement.

14. The apparatus of claim 11 wherein the drive shaft is a single inline shaft arrangement.

15. The apparatus of claim 11 wherein the  
30 drive shaft is a dual drive shaft arrangement.

16. A method for horizontally actuating hemming and stamping die sets comprising the steps of:

5 supporting a vertically extending platen for horizontal motion and a drive support on a horizontally disposed base support;

attaching a punch die set to said platen and a drive mechanism and an anvil die set to said drive support;

10 coupling crank arms of said drive mechanism to said platen via link bars;

actuating said drive mechanism to move said platen and said punch die set across said horizontal base support to contact the anvil die set, whereby  
15 the side-by-side horizontal movement of the die set is used to perform hemming and stamping operations on a working piece.